

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Process for producing a low volatility metal flake pigment composition, which comprises milling metal powder in a milling fluid, wherein the milling fluid comprises a low volatility fluid selected from glycols and non-aqueous, non-hydrocarbon, low volatility fluid~~s~~fluids that ~~is~~are both solvent and water miscible, other than alcohols or esters.
2. (Original) Process for producing a low volatility metal flake pigment composition, which comprises milling a mixture consisting of metal powder and a non-aqueous, non-hydrocarbon, low volatility milling fluid that is both solvent and water miscible, wherein the milling fluid consists of an alcohol or an ester.
3. (Original) Process according to claim 1, which further comprises the addition of one or more substances that act as a lubricant and/or corrosion inhibitor.
4. (Original) Process according to claim 1, which further comprises the step of removing oversize or undersize particles after milling.
5. (Original) Process according to claim 1, which further comprises concentrating after milling to a metal flake pigment paste of 50-90% metal by weight.
6. (Original) Process according to claim 5, wherein the paste is converted to a granule form by incorporating an organic binder to form a coherent paste of organic binder, milling fluid and metal flake pigment.
7. (Original) Process according to claim 6, wherein the paste of organic binder, milling fluid and metal flake pigment is in a particulate form such that at least 98% by weight of the particles are retained on a sieve having a 150 µm aperture.

8. (Original) Process according to claim 6, wherein the granules have a length of 5 to 20 mm and a thickness of 1.5 to 3 mm.

9. (Original) Process according to claim 6, wherein part or all of the milling fluid is removed at elevated temperature.

10. (Original) Process according to claim 1, which further comprises a step of treating the milled metal flakes in the milling fluid.

11. (Original) Processing according to claim 10, wherein the metal flakes are treated with a phosphate, silica or alumina, ammonium dichromate or ammonium or potassium permanganate.

12. (Original) Process according to claim 1, wherein the metal flakes are thermally treated after the milling step.

13. (Original) Process according to claim 1, wherein the milling fluid is ethylene glycol, dimethylene glycol, diethylene glycol, trimethylene glycol, triethylene glycol, propylene glycols, butylene glycols, glycerol, gamma butyrolactone, 2-pyrrolidone, N-methylpyrrolidone, isophorone, triacetin, 2,5-hexanedione, tetraethylene pentamine, triethyl phosphate, ethyl acetoacetate, n-methyl formamide, propylene carbonate, ethylene glycol monobutyl ether, diethylene glycol monomethyl, monoethyl, monopropyl and monobutyl ethers, triethylene glycol monomethyl, monoethyl, monopropyl and monobutyl ethers, diethylene glycol dimethyl, diethyl, dipropyl and dibutyl ethers, triethylene glycol dimethyl, diethyl, dipropyl and dibutyl ethers, propylene glycol monobutyl ether, dipropylene glycol monomethyl, monoethyl, monopropyl and monobutyl ethers, tripropylene glycol monomethyl, monoethyl, monopropyl and monobutyl ethers, dipropylene glycol dimethyl, diethyl, dipropyl and dibutyl ethers, tripropylene glycol

dimethyl, diethyl, dipropyl and dibutyl ethers, diamyl ether, or a mixture of any two or more of these.

14. (Original) Process according to claim 13, wherein the milling fluid is propylene carbonate, tripropylene glycol monomethyl ether, dipropylene glycol dimethyl ether or dipropylene glycol n-propyl ether.

15. (Original) Process according to claim 2, wherein the milling fluid consists of pentyl alcohol, hexyl alcohol, 2(2-n-butoxy ethoxy ethanol), tetrahydropyran, tetrahydropyran-2-methanol, methoxypropyl acetate, ethylene glycol monobutyl ether acetate, diethylene glycol monomethyl ether acetate, diethylene glycol monoethyl ether acetate, diethylene glycol monobutyl ether acetate, dipropylene glycol monomethyl ether acetate, propylene glycol diacetate, methyl, ethyl and propyl lactate or the monomethyl, monoethyl, dimethyl and diethyl esters or succinic, glutaric and adipic acids, or a mixture of any two or more of these.

16. (Original) Process according to claim 15, wherein the milling fluid is diethylene glycol monomethyl ether acetate, diethylene glycol monobutyl ether acetate, or mixtures of dimethyl esters of adipic, glutaric and succinic acids.

17. (Original) Process according to claim 1, wherein the metal is aluminium, zinc, copper, tin, nickel, silver, gold, iron, or an alloy thereof.

18. (Original) Process according to claim 17, wherein the metal is aluminium or gold bronze.

19. (Original) Process according to claim 1, wherein the metal pigment particles have a median diameter of 6 µm to 600 µm.

20. (Previously Presented) Process according to claim 19, wherein the metal pigment particles have a median diameter of 10 µm to 300 µm.

21. (Original) Process according to claim 3, wherein the corrosion inhibitor is calcium phosphate, magnesium phosphate, calcium phosphosilicate, calcium strontium phosphosilicate, aluminium zirconium zinc phosphosilicate, calcium strontium zinc phosphosilicate, alkyl and dialkyl phosphates, phosphites and their derivatives, phosphonic acid derivatives, phosphate esters of long chain ethoxylated alcohols, organic silanes or silicates, compounds of molybdenum, vanadium, titanium, zirconium, and tungsten and heteropolyanionic compounds thereof, ammonium dichromate or chromic acid.

22. (Original) Process according to claim 3, wherein the lubricant is a long chain or polymeric fatty acid, a phosphate ester of a long chain ethoxylated alcohol, lauryl phosphonic acid, lauryl phosphate or a mineral oil.

23. (Original) Process according to claim 1, comprising ball milling the metal powder.

24. (Original) Use of a non-aqueous, non-hydrocarbon milling fluid in a process of milling a metal powder as claimed in claim 1.

25. (Original) A metal pigment paste obtainable by the process of claim 1.

26. (Original) A granule obtainable by the process of claim 6.

27. (Original) A granule produced by the process of claim 6.

28. (Original) An ink or surface coating comprising the metal pigment paste or granules produced by a process according to claim 1 and surface coating binders dissolved or dispersed in water, solvent or mixtures of the two.

29. (Original) Article obtainable by shaping a composition comprising granules produced by the process of claim 6.

30. (Original) Article obtainable by injection moulding or by extrusion of a thermoplastic, comprising granules produced by the process of claim 6.

WHEELER
Appl. No. 10/551,774
October 1, 2008

31. (Original) Shaped article comprising a thermoplastic or thermosetting polymer and granules produced by the process of claim 6.